2.0 Site Operations and Maintenance

2.1 Annual Site Inspection

The RFLMA-required annual inspection of the COU was performed on March 19, 2007 (refer to DOE 2007g). The inspection team included 12 personnel from the Rocky Flats office. The inspection focused on the areas other than the OLF, PLF, and treatment systems, which are routinely inspected as described in the quarterly report. The team was briefed prior to the inspection regarding the specific items of inspection, including indication of adverse biological effects, any violation of the remedy-required institutional controls, evidence of erosion, evidence of differential settlement or subsidence, and the presence of large pieces of demolition debris that might indicate erosion. There were no major findings or concerns. Observations and disposition of the observed items were entered into the Site Log.

2.2 CERCLA 5-Year Review

In 2007, DOE-LM conducted the second 5-year review of remedial actions implemented at Rocky Flats. Because remaining contamination in the COU does not allow for unlimited use and unrestricted exposure, periodic reviews are required by CERCLA to be conducted at least every 5 years to determine whether the COU remedial actions remain protective of human health and the environment.

The first 5-year review at Rocky Flats was conducted for the period May 1997 through April 2002 and was performed when cleanup and closure activities were ongoing under RFCA. The second 5-year review covered the period May 2002 through April 2007 and evaluated the performance of the remedy implemented under the final CAD/ROD.

The review was conducted in accordance with EPA's *Comprehensive Five-Year Review Guidance,* dated June 2001. DOE, as the CERCLA federal lead agency under Executive Order 12580, conducted the review, using a team composed of knowledgeable DOE, DOE's contractor, CDPHE, and EPA staff. Community notification and involvement activities included posting information about the review on the Rocky Flats website, publication of a notice of the review in the local newspaper on March 4, 2007, and public briefings.

The review assessed the performance of the final remedy in relation to remedy objectives and implementation requirements. Note that remedy selection decisions are not reopened but are evaluated against new requirements, if any.

The review addressed three questions to assess the protectiveness of the remedy, with the following approach and conclusions:

- Question A: Is the remedy functioning as intended? The technical performance of the remedy, including monitoring data, system performance, and conduct and results of operation and maintenance, was determined to be consistent with that intended by the remedy. The required physical and institutional controls were determined to be in place and successfully preventing exposure. In addition to ongoing inspections of remedy components in accordance with RFLMA requirements, a COU inspection was also

conducted on March 19, 2007. No significant items were found that would call into question the protectiveness of the remedy. The answer to this question is "yes."

- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) still valid? The Comprehensive Risk Assessment underlying exposure scenarios and parameters remain valid and no changes have occurred in reference doses or slope factors, or applicable or relevant and appropriate requirements that would change the protectiveness of the remedy. The remedy RAOs also remain valid. The RAOs for contaminated groundwater are to prevent adverse impacts to surface-water quality, prevent exposure to groundwater above maximum contaminant levels (MCLs), and restore groundwater to meet surface-water standards. The RAO for surface water is to meet surface-water standards, and the RAOs for contaminated soil are to prevent adverse impacts to groundwater and surface water and to prevent unacceptable risks from exposure. The answer to this question is "yes."
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No new information not addressed or anticipated in the CAD/ROD was identified that could call into question the protectiveness of the remedy. The answer to this question is "no."

Based on the answers to Questions A, B, and C, the 5-year review assessment concluded that the COU remedy continues to be protective of human health and the environment. The following issues, recommendations, and follow-up actions were identified.

GS10 Uranium (U) Concentrations (see Section 3.1.2.2)

Issue: Samples from GS10, the surface-water monitoring Points of Evaluation (POE) in South Walnut Creek at the Pond B-1 bypass, contained total U concentrations above the surface-water standard in 2006. Surface water discharged from the COU meets surface-water standards. Evaluation suggests that the GS10 levels are due to changes in hydrologic conditions, resulting in groundwater with predominantly naturally occurring U making up a larger proportion of stream flow at GS10.

Recommendation: Continue to monitor in accordance with RFLMA requirements. Employ special analytical methods to determine whether natural U isotopic signatures have significantly changed from the levels prior to closure.

U Concentrations at OLF Wells (see Sections 3.1.2.9 and 3.1.5.4)

Issue: U analytical results are higher than the surface-water standard in one of three downgradient wells.

Recommendation: Continue to monitor the OLF groundwater in accordance with RFLMA requirements. Employ special analytical methods to determine whether isotopic signatures indicate the results are predominantly natural U.

Sentinel Well 45605 (see Sections 2.7.2 and 3.1.5.4)

Issue: Sentinel well 45605 is located within a hillside slump south of former Building 991, which has moved the well casing out of vertical, and the serviceability of the well is uncertain.

Recommendation: Continue to monitor this well in accordance with RFLMA. If necessary, after movement in the area stops, replace the well after regrading of the hillside has been completed.

Water-Quality Standards Changes (see Section 2.3)

Issue: Changes to RFLMA surface-water standards for arsenic, copper, and U may be promulgated by the Colorado Water Quality Control Commission (WQCC) at the completion of the triennial review for the Big Dry Creek Basin in 2009. Also, the existing temporary modifications (TMs) to the standards for nitrates and certain volatile organic compounds (VOCs) incorporated in the RFLMA surface-water standards are set to expire in 2009. The impacts of any changes to standards at the time of completion of the Colorado WQCC triennial review will depend on the results of continuing remedy implementation activities.

Recommendation: DOE should actively participate in the triennial review process to identify issues and collect and provide any necessary data to the WQCC for its decision-making process.

OLF Cover (see Section 2.5.2)

Issue: Routine inspections have identified historical seeps and small areas of slumps and slides on the OLF cover that need to be addressed and repaired as necessary to continue to meet cover design criteria.

Recommendation: Continue to inspect the OLF cover in accordance with RFLMA requirements. Cover repairs should be made in accordance with the OLF Monitoring and Maintenance (M&M) Plan so that design criteria continue to be met. An engineering evaluation to identify possible causes as well as approaches to address the causes should be completed.

Solar Ponds Plume (SPP) Treatment System (SPPTS) Treatability Study (see Section 3.1.5.4)

Issue: Routine maintenance for this system is difficult and inefficient.

Recommendation: Complete treatability study to determine whether a simpler, more efficient, and less management-intensive system could be designed and installed. Based on the results, proposed modifications should be developed in accordance with RFLMA.

RFLMA requires an evaluation of actions that could reduce the need to rely on institutional controls and the 5-year review considered new technologies that might reduce groundwater contamination faster or more efficiently than the current remedy. None were identified for further investigation.

RFLMA also specifies that the inspection frequency of the final cover and stormwater management systems for the OLF and PLF be evaluated in the CERCLA periodic review. Under the landfill M&M Plans, monthly inspections have been ongoing since June 2006 and it is recommended that the frequency be reduced to quarterly for the PLF.

The next 5-year review report will be submitted to EPA for concurrence by August 1, 2012.

2.3 WQCC Proceedings Related to Rocky Flats

Several Colorado WQCC proceedings related to Rocky Flats surface-water standards occurred in 2007, as described below. As recommended by the CERCLA 5-year review, the Site is actively participating in the triennial review process to identify issues and collect and provide any necessary data to the WQCC for its decision-making process.

The U surface-water standard for Rocky Flats, adopted based on an ambient water quality determination in 1989, is 10 picocuries per liter (pCi/L) for North Walnut Creek and 11 pCi/L for Woman Creek. Based on post-closure conditions groundwater makes up more of the stream baseflow than it did prior to closure. In post-closure, surface-water concentrations have approached and may exceed the site-specific standard in the future due to the predominant natural U concentrations in groundwater. The statewide basic U standard, adopted by the WQCC in 2005, is 30 micrograms per liter (μg/L) (equivalent to 20 pCi/L), which is the EPA MCL for drinking water. Surface water is impounded in the terminal ponds, and sampled for compliance with the standard before release through the POC monitoring locations.

A Petition for Rulemaking to remove the site-specific U surface-water standard was filed with the WQCC on July 31, 2007, so that the statewide basic standard would be the standard at Rocky Flats. Elimination of the site-specific U standard in favor of the statewide standard may obviate the possible need to develop management or treatment options for impounded surface water in the terminal ponds if future U concentrations approach or slightly exceed the current site-specific standard.

The WQCC considered DOE's petition at its August 13 meeting. Rocky Flats staff presented a short briefing on the petition and rationale for the timing and answered questions. Local municipality staff members also spoke at the meeting, and requested that more time be allowed to obtain analyses to determine if the predominance of naturally occurring U in groundwater is consistent with pre-closure findings, and to consult regarding the implications of changing the standard. The WQCC decided to accept the petition and set the matter for formal rulemaking, but set a hearing date for January 2009 instead of the date requested in the petition of January 2008. Staff will continue to consult with the local municipality stakeholders as the formal rulemaking proceeds.

The WQCC also held hearings related to issues scoping for the next South Platte River Basin triennial review and also regarding TMs set to expire before February 28, 2010. In accordance with Colorado law, the WQCC must consider retaining, changing, or eliminating existing TMs in Colorado that are set to expire within 2 years. TMs for nitrate/nitrite and six volatile/semivolatile organic analytes are relevant to stream segments at Rocky Flats and will expire on December 31, 2009, and Rocky Flats streams are included in the South Platte River Basin.

The issues scoping hearing for the triennial review for the South Platte River Basin was held October 9, 2007. The issues potentially affecting Rocky Flats presented to the WQCC for possible rulemaking during the triennial review are the TMs relevant to Rocky Flats that are set to expire; the anticipated lowering of the statewide arsenic standard to conform to the EPA standard of 10 μg/L; and the current Rocky Flats petition for rulemaking to adopt the statewide basic standard for U. The WQCC recommended that Rocky Flats staff work with the Colorado

Water Quality Control Division staff to develop the necessary evidence for the next phases of the rulemaking process. The next phases are the WQCC issues formulation hearing in November 2008 and the rulemaking hearing in June 2009.

The WQCC hearing on TMs was held on December 10, 2008. Consistent with the pre-hearing filings, the WQCC retained the December 31, 2009, expiration date for the current Rocky Flats stream segments TMs. All TMs in Colorado, and thus those in place at Rocky Flats, set to expire within 2 years will again be considered by the WQCC in 2009.

2.4 Pond Operations

Twelve constructed ponds collect and manage surface-water runoff at the Site. The ponds are grouped together in series based on the drainage in which they are located, with the A-Series Ponds in North Walnut Creek, the B-Series Ponds in South Walnut Creek, the C-Series Ponds in Woman Creek, and the Landfill Pond in No Name Gulch. Ponds A-4, B-5, and C-2 are referred to as "terminal ponds," because they are the farthest downstream ponds in their respective drainages, and the ponds from which water is discharged off the Site. Off-site discharges of water from the terminal ponds are currently performed using a batch release method.

During CY 2007, the Site performed four terminal pond discharges. Ponds A-4 and B-5 were each discharged twice (Table 2-1). Pond A-3 was discharged to Pond A-4 four times in CY 2007 (Table 2-1). For habitat enhancement, water was periodically allowed to enter Pond B-1 from South Walnut Creek, and Ponds A-1 and A-2 from North Walnut Creek. As of December 31, 2007, Ponds A-3, A-4, B-5, C-2, and the Landfill Pond were holding a total of approximately 16.2 million gallons (16.4 percent of total capacity).

Table 2-1. CY 2007 Pond Water Discharges and Transfers

Discharge/Transfer	Dates	Volume (million gallons)
Pond A-3 to A-4	1/10−1/24/07	5.68
Pond A-3 to A-4	2/7−2/12/07	4.95
Pond A-4 to Walnut Creek	3/1−3/13/07	10.25
Pond B-5 to Walnut Creek	3/1−3/13/07	7.47
Pond A-3 to A-4	3/13−3/28/07	7.67
Pond A-3 to A-4	4/25−5/4/07	7.47
Pond A-4 to Walnut Creek	7/5−7/26/07	10.39
Pond B-5 to Walnut Creek	7/5−7/12/07	3.13

Monthly routine dam inspections, pond level measurements, and piezometer measurements were performed as scheduled during the year. Annual dam mowing and vegetation removal was completed in July and August. Semiannual movement monument surveys and inclinometer readings were also performed as scheduled.

In compliance with the State of Colorado "Rules and Regulations for Dam Safety and Dam Construction," a formal dam safety inspection by a registered professional engineer was completed for all dams in September. All Rocky Flats dams received a *Satisfactory* condition rating and a recommended safe storage level of *Full*. Several recommendations to improve dam

safety were identified. The final report was submitted to the Colorado Office of the State Engineer, satisfying the periodic 6-year reporting requirement.

2.5 Landfills

The annual report of the results of inspections, monitoring data, and maintenance activities for the PLF and OLF is provided below.

2.5.1 Present Landfill

The PLF consists of an approximately 22-acre engineered RCRA Subtitle C-compliant cover over a former sanitary/construction debris landfill. A diversion channel surrounds the landfill and diverts stormwater runoff away from the landfill to No Name Gulch. The landfill has a passive seep interception and treatment system (the Present Landfill Treatment System [PLFTS]), installed to treat landfill seep water and groundwater intercept system (GWIS) water that discharges into the Landfill Pond. A gas extraction system is also built into the landfill and allows subsurface gas to vent to the atmosphere.

Subsidence and consolidation at the PLF is monitored by visually inspecting the surface of the landfill cover for cracks, depressions, heaving, and sinkholes. The landfill final construction site conditions are used as a baseline for comparisons made during site inspections. In addition to the visual inspection, settlement monuments are used to evaluate the actual settlement at these specific locations compared to the expected settlement calculated in the final design. Nine settlement monuments were installed across the top of the landfill cap, with an additional six monuments located on the east face of the landfill. The monuments are monitored quarterly for the first year, and annually thereafter. The first survey of these locations was performed during fourth quarter CY 2006. Annual surveys were initiated in fourth quarter CY 2007.

Inspections and monitoring tasks follow the format and protocol established in the *Present Landfill Monitoring and Maintenance Plan* (PLF M&M Plan) and include groundwater and surface-water monitoring, and monitoring subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, and erosion in surrounding features so that corrective actions can be taken in a timely manner. Monthly inspections were initiated in October 2005. Quarterly inspections were initiated in fourth quarter CY 2007 as described in RFLMA Contact Record 2007-08.

2.5.1.1 Inspection Results

Eleven inspections were performed at the PLF in CY 2007. The inspection process followed the format and protocol established in the PLF M&M Plan. No significant problems were observed during these inspections. Appendix C contains the landfill inspection forms for fourth quarter CY 2007; earlier 2007 inspections forms are included in the applicable quarterly reports.

PLF area surface-water and groundwater monitoring, and operation of the PLFTS, is covered in those respective sections of this report.

2.5.1.2 Slumps

On February 13, 2007, a slump was discovered on the north-facing hillside just east of the PLF. The slump is not on the PLF and it was determined by engineering review that it does not impact the PLF cover. The slump was likely caused by heavy snow conditions and influenced by the post-closure lower water levels in the Landfill Pond. Therefore regrading of the slump is not necessary; however, deep-rooted plants were planted in the slump area to promote stabilization. There were no significant changes to the slumping area for the remainder of 2007.

2.5.1.3 Settlement Monuments

Surveys were completed in March, June, August, and December of 2007. Results of the settlement monument surveys indicate settling at each monument does not exceed expected settlement calculated in the final design and does not trigger any maintenance activity under the PLF M&M Plan.

2.5.2 Original Landfill

The OLF consists of an approximately 20-acre soil cover over a former solid sanitary and construction debris landfill. The final cover consists of a 2-foot-thick Rocky Flats Alluvium soil cover that was constructed over both a regraded surface and a buttress fill and revegetated. The original surface was regraded to provide a consistent slope. A 20-foot-high, 1,000-foot-long soil mass buttress fill was placed at the toe of the landfill. Erosion is controlled by a series of diversion berms that carry storm runoff away from the cover to channels on the east and west perimeter of the cover.

Inspections of the OLF are conducted monthly in accordance with the *Final Landfill Monitoring and Maintenance Plan* (OLF M&M Plan).

2.5.2.1 Inspection Results

Twelve inspections were performed at the OLF in CY 2007. The inspection process followed the format and protocol established in the OLF M&M Plan. Appendix C contains the landfill inspection forms for fourth quarter CY2007; earlier 2007 inspections forms are included in the applicable quarterly reports.

OLF area surface-water and groundwater monitoring is covered in those respective sections of this report.

Conditions that warranted repair and that triggered further investigation were found at the OLF during 2007 inspections, as discussed below. Figure 2-1 is an aerial photograph of the OLF taken in June 2007 that illustrates the locations of the observed conditions.

A meeting with CDPHE and EPA to discuss OLF inspection findings was held on May 17. Discussion topics included possible mechanisms for the conditions observed at the OLF; allowing deeper-rooted plants in areas of higher moisture; extending the subsurface drain for Seep #7 northward to capture the seep; requirements for berm height and flow channel cross section; and inspecting soils and installing French drains at other seep/slump locations. A

summary of the meeting discussions and a proposed plan for OLF repair activities was transmitted to CDPHE. The plan responds to recommendations made in the CERCLA 5-year review (Section 2.2), and included proposed near-term repairs; proposed geotechnical investigation to determine the mechanisms that are causing the slumping; proposed revisions to the OLF M&M Plan; and design and construction of final repairs and modifications to address the problems documented at the OLF.

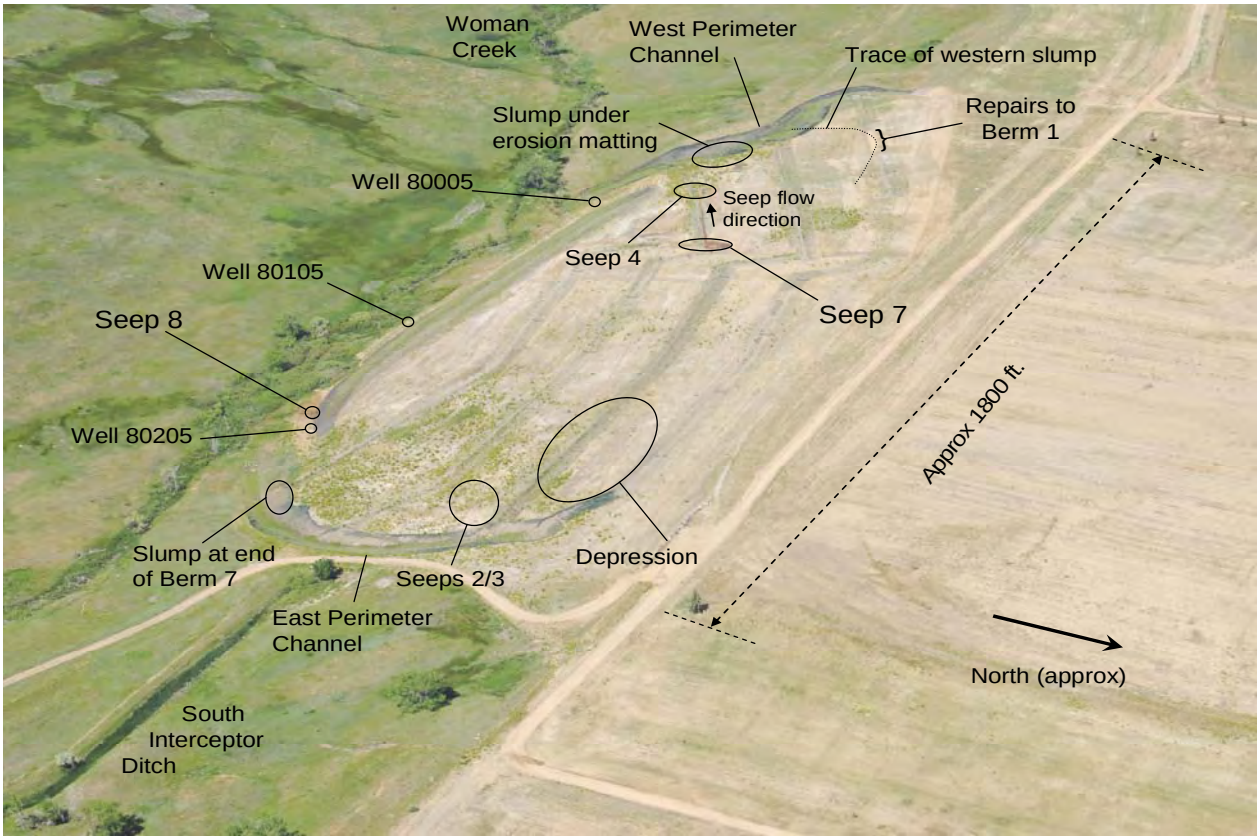

Figure 2-1. Aerial Photograph of OLF Taken June 2007

On November 12, the Final OLF Geotechnical Investigation Work Plan was submitted to CDPHE for review and subsequent approval. Phase 1 of the OLF geotechnical investigation (nonintrusive work) began on December 3 and consisted of a geophysical survey. The survey included using sonar instruments to catalog areas of waste beneath the cover, and was completed on December 6. Resulting data will be used to determine whether proposed test pit and borehole locations need to be moved for Phase 2 of the project. This intrusive work is expected to occur in February 2008.

2.5.2.2 Seeps

Seeps #4, #7, and #8 at the OLF were evaluated during the monthly inspections as well as during unscheduled visits throughout the year. Seep #7 flowed steadily beginning in January, but dried out in July and ceased to flow through the rest of the year except temporarily after precipitation events. Seep #4 showed areas of continuous active groundwater seepage throughout the year that was drained by Berm #3 into the western perimeter channel. A new seep, Seep #8, also showed

continuous steady flow of several gallons per minute throughout the year. Outfall from Seep #8 is channeled through various constructed pathways to help maximize wetland area and eventually drains into Woman Creek.

On August 9, the EPA and CDPHE RFLMA project coordinators and EPA staff walked down the OLF. EPA expressed interest in the regulatory status of the new seep (Seep #8) that surfaces at the east end of the buttress, which may be associated, at least in part, with the groundwater collected by the buttress drain. Samples from Seep #8 were collected on August 23. Refer to the third quarter CY 2007 report (DOE 2008a) for associated analytical results, which showed no water-quality concerns.

Other smaller seeps showed areas of wetness only temporarily after precipitation events. None produced any surface flow.

2.5.2.3 Slumps

Soil movement, including slumps, was observed on several occasions and in several locations at the OLF in 2007. Individual slump areas are discussed below.

Berm #1 Slump

On February 7, 2007, a slump below Berm #1 was documented following the melting of several heavy snowfalls and the associated 6- to 8-foot snow drifts. The slump cracks extended from the western perimeter channel up through Berm #1 and out to the east below Berm #1. The total length of this arcuate feature was approximately 200 feet. The slump was immediately staked, photographed, and surveyed with a global positioning system (GPS) unit. The cracks that extended through Berm #1 were covered with plastic sheeting and secured with sand bags to help prevent water from infiltrating the cracks and causing more movement of the berm.

A project designed to fill the crack in Berm #1 and raise the berm freeboard height back to 2 feet as required by the OLF M&M Plan was undertaken from March 14 through April 12. The project involved the addition and compaction of approximately 120 tons of Rocky Flats Alluvium. The berm was then covered with erosion control matting and reseeded. Photographs of the project were taken and included in the monthly landfill inspection report.

The slump at Berm #1 of the OLF cracked through the berm a second time, as documented on May 7. Repairs included adding and compacting a total of 38 tons of Rocky Flats Alluvium, which was completed on May 10. The berm was then re-covered with erosion control matting and revegetated.

The OLF Action Plan Phase 1 repairs were completed on August 2. The subcontractor smoothed and compacted the area of the main crack that extended below Berm #1 and into the western perimeter channel. The subcontractors then imported and compacted 227 tons of Rocky Flats Alluvium in the area of the crack to ensure that a 2-foot cover thickness was retained as required. The west portion of Berm #1 and all of the smaller sets of cracks between Berms #1 and #3 were also filled and compacted. The subcontractor subsequently reseeded the disturbed area of the cover and secured it with erosion control matting. This area did not show any signs of further slumping through the end of 2007.

Berm #4 Depression

A depression below Berm #4 on the east side of the OLF was observed on February 7, 2007. The western perimeter of the depression extends through a small area of Berm #5 but is not affecting the integrity of the berm. The depression has been staked, photographed, and surveyed with a GPS unit to help evaluate any additional movement. The depression will continue to be monitored during both scheduled inspections and unscheduled visits to the area.

Western Perimeter Channel Slump

A minor slump was observed in early 2006 on the edge of the western perimeter channel of the OLF between Berms #2 and #3. At that time, the area of slumping soil was delineated with pin flags, and the extent defined with the field GPS to provide an estimation of the aerial extent of the slump. Photographs were taken to help evaluate subtle changes over time. The slump has since extended southward to Berm #3 and still appears to be active. The slump is not affecting the outfall of Berm #3 and is not a threat to the integrity of the OLF cap or the perimeter channel. The slump will continue to be monitored during both scheduled inspections and unscheduled visits to the area.

Berm #2 Slump

A small crack in Berm #2 of the OLF from the eastern extent of the Berm #1 slump was documented on May 14. The crack was filled with Rocky Flats Alluvium and compacted on May 15.

Berm #7 Slump

A slump at the east end of Berm #7 was discovered in April 2007. The eastern end of this berm has slid into the eastern perimeter channel, presumably due to increased moisture content and the berm's position overhanging the perimeter channel. The new slump was staked, photographed, and located with a field GPS instrument. No changes occurred in the slump throughout the rest of the year.

2.5.2.4 Settlement Monuments

Six settlement monuments were installed at the OLF from March to April 2007. Settlement monument D was installed on July 5, after conditions dried enough to allow installation. The remaining monument will be installed upon the completion of the OLF geotechnical investigation or a subsequent repair project if necessary.

The settlement monuments were surveyed in June, August, and December 2007. Preliminary survey data indicate settling at each monument does not exceed expected settling calculated in the final design and does not trigger any maintenance activity under the OLF M&M Plan.

2.5.2.5 Consolidation Monitors

On September 19, 2007, 20 consolidation monitors (3-foot sections of rebar driven 2 feet into the ground and topped with a plastic cap) were installed at the OLF in the Berm #1 slump area. The

monitors were surveyed throughout the rest of the year on a monthly basis to help determine movement in the area. No significant movement was recorded for any of the surveys through the end of CY 2007.

2.5.2.6 Erosion Controls

The "Wattle Replacement Project" at the OLF began on May 29, 2007, and was completed on June 4. (Wattles are straw tubes that help prevent erosion from large precipitation events.) The subcontractor installed new wattles across the entire cover of the landfill except for the slide area between Berms #1 and #2. This area will have the wattles replaced upon completion of the OLF geotechnical investigation or subsequent construction project.

2.5.2.7 OLF Berm Survey

Surveyors completed surveys on the OLF berm crests and troughs the week of April 30, 2007. In areas where the grade of the troughs was found to be less than 1 percent, additional cross-sectional surveys were performed to evaluate repairs that would be necessary to fix the grade. Any repairs to the berms to maintain required berm heights will be recommended based on the results of the geotechnical investigation.

2.6 Groundwater Plume Treatment Systems Maintenance

The system-specific summaries below focus on the maintenance and operation of the Mound Site Plume Treatment System (MSPTS), the East Trenches Plume Treatment System (ETPTS), and the SPPTS. Details of the monitoring of the systems, including the PLFTS, are presented in Section 3.1.2.10.

2.6.1 Mound Site Plume Treatment System

Routine maintenance activities continued at the MSPTS through fourth quarter CY 2007. These activities included weekly raking of the media and inspection of influent and effluent flow conditions. In addition, the flow direction through the system was changed from a downflow to an upflow configuration in September. See Section 3.1.2.10 for additional information.

2.6.2 East Trenches Plume Treatment System

Routine maintenance activities continued at the ETPTS through fourth quarter CY 2007. This included weekly raking of the media and inspection of influent and effluent flow conditions. In addition, the flow direction through the system was changed from a downflow to an upflow configuration in September. See Section 3.1.2.10 for additional information.

2.6.3 Solar Ponds Plume Treatment System

Routine maintenance activities continued at the SPPTS through fourth quarter CY 2007. This included weekly inspection of the solar/battery system that powers the pump, operation of the pump, and influent and effluent flow conditions.

The solar pump system began operating erratically in December 2007, first shutting down on December 8. It resumed operation soon after with no intervention from Site staff; this pattern continued through the month. Evaluations suggested the erratic operation was related to weather conditions, as the pump appeared to shut down only during periods of colder temperatures. At the end of the year, efforts were underway to replace the batteries although they may not have been the primary cause. Instead, water may have been freezing in the transfer line between the collection well and the treatment cells, where this line nears the ground surface, thereby blocking the line and causing the pump to shut down. Additional improvements will be made as contributing factors to this condition are identified.

2.7 Erosion Control and Revegetation

The existing erosion controls are maintained and repaired to protect the bare soil areas until the vegetation can stabilize the soil. Areas lacking sufficient vegetative cover are assessed and typically reseeded or in some cases have soil amendments added to assist in the establishment of the native vegetation in these areas. Additional information on the revegetation activities that were conducted at the Site during 2007 is provided in Section 3.3.2.3 of this annual report.

2.7.1 Erosion Control

During 2007, the *Erosion Control Plan for the Rocky Flats Property Central Operable Unit* was finalized (DOE 2007b). The plan addresses the regulatory approach, monitoring inspections, and applicability and scope of erosion control activities at the Site. It outlines the responsibilities, BMPs, and implementation aspects for erosion control activities before, during, and after projects.

Maintenance, repair, replacement, and monitoring of the Site erosion control features continued through 2007, as needed. Assessing the erosion control is especially important following high wind events that are common at the Site and after significant precipitation events. Typical repairs included restaking (or weighting with rocks) wattles or erosion blankets that had become loose.

2.7.2 Slump South of Former Building 991

Site personnel and support staff inspected the slump that had developed on the hillside south of former Building 991 on July 17, 2007. Additional cracks indicative of continuing movement were noted. The path forward and observations from a walkdown with DOE were discussed. The preferred line for the toe of the slope was defined, with consideration of ecological factors, to delineate the proposed regrading activities. The proposed grade of the hillside was determined. New survey data were collected July 17 to refine estimates of excess material generated and to develop the conceptual design.

In September 2007, a conceptual design for regrading the slump was prepared for consultation with CDPHE. Sampling of the Sentinel well within the slump (well 45605) was performed, and the well was subsequently abandoned. (This well will be replaced in 2008; see Section 3.1.5.4 for additional information on the well and slump.) CDPHE approved RFLMA Contact Record 2007-05 to allow excavation and fill and the proposed final elevations. The final design was then completed and issued.

On October 12, heavy equipment was mobilized to the Site. Following a preconstruction briefing and installation of preliminary erosion controls, culverts, and a haul road, regrading began. Excess excavated material was hauled to the 903 Pad/Lip areas, where it was spread to prepare the area for revegetation activities (an activity that had already been scheduled in addition to the slump regrade, but now benefited from the addition of soil). Grading activities on the slump hillside were completed on November 8, and the revegetation phase of the project was completed on the 903 Pad/Lip Area and the 991 Hillside on November 20.

On December 5, staff installed 13 consolidation monitors across the regraded hillside to assist in monitoring potential future hillside movement. The consolidation monitors will be surveyed annually or more frequently if cracks become apparent on the hillside. Surveying lathes were placed at the turning points on the hillside and will be used as reference points to help determine where the original cracks were present on the hillside before the recent hillside repairs were completed.

2.7.3 Former Building 371 Area Regrade

Several locations in the vicinity of former B371 showed standing water following precipitation events. The B371/Functional Channel (FC)-1 Regrade Project was initiated to add fill from FC-1 to improve drainage into FC-1 and FC-2, and simultaneously to improve a portion of the bottom of FC-1 to support wetland vegetation if sufficient moisture is present. CDPHE approved RFLMA Contact Record 2007-03 to allow excavation and fill and the proposed final elevations. Heavy equipment was mobilized on August 23 and the construction was finished by September 22. Erosion controls were applied and the area was reseeded. Refer to Section 3.1.5.4 for additional information on the reasons for this regrade, and to Section 3.3.2.3 for more detail on the revegetation.

2.8 General Site Maintenance and Operations

The Site is managed and maintained and activities are conducted pursuant to DOE's jurisdiction and control responsibilities. These activities help maintain the general condition of the Site through BMPs. Assessment of the Site is performed on both a scheduled and continuous basis. Highlights of the routine and nonroutine maintenance and operations are described below.

2.8.1 Road Upgrades

After a significant snowmelt in late January and early February of 2007, the Site experienced minor erosion of several road areas. Temporary repairs were required to allow uninterrupted travel to all of the necessary locations of the Site. This repair project focused on short segments of Site roads. Road-base and drain rock were added in some locations. Work began on March 21 and was completed April 3, 2007.

The site received 1.5 inches of rain on April 25, eroding portions of the road to the A-Series Ponds. Small drainages were dug the same day to help water flow down the existing ditch on the east side of the road as an interim repair. The A-Series Ponds Road Repair Project was developed to construct a water management structure on the west side of the road that would help drain water into the existing drainage. The project also included grading the road to get rid

of the small areas of erosion that formed during the precipitation event. The project began on May 22 and was completed on June 1.

A larger roads improvement project was performed, and is referred to as the Roads III Project. CDPHE approved RFLMA Contact Record 2007-04 to allow grading and proposed final elevations. Designs reflected consideration of Preble's meadow jumping mouse (PMJM) and wetland issues. USFWS was notified as required. The subcontract was initiated August 20. Work was halted on September 13 when a road grader hit a live underground power line near the intersection of Walnut Creek and Indiana Street. The project was immediately stopped, and the necessary notifications were made. Work resumed on September 25 and was completed on September 28.

On November 26, staff installed three rock crossings on the road to the PLF to prevent erosion in this area. The rock crossings will help channel runoff from precipitation events into the existing ditch that runs along the west side of the road.

2.8.2 Electrical Lines

On July 20, 2007, Site staff escorted Xcel Energy personnel who tested transformers on the electrical lines along the east side of the federal property (i.e., along the west side of Indiana Street) for polychlorinated biphenyls (PCBs). A sagging power line on the east side of Rocky Flats was also tightened. The testing and work was completed on July 21, and found no regulated levels of PCBs in the transformers.

In August Xcel installed a single meter to supply power to the remaining 13.2-kilovolt power line at the Site, which continues to feed two surface-water monitoring stations, two air sampling stations, and one CDPHE air quality monitoring station.

2.8.3 Fence Maintenance and Construction

2.8.3.1 COU Fence

Construction of the fence surrounding the COU began on November 6, 2006. The construction was suspended on December 20, 2006, due to unusually heavy snow accumulation. Ground conditions were assessed frequently in the following days and weeks; however, several additional snowstorms as well as drifts caused by the wind prevented safe resumption of the work. Construction of the fence resumed on February 22, 2007, and was completed on March 22. "No Trespassing" signs required as physical controls under RFLMA were attached to the fence by March 23. Signs that are required by RFLMA at the entrances to the COU, listing the use restrictions for this OU, were also posted. Inspections of the signs and postings are conducted on a quarterly basis.

The entire 7-mile-long COU fence was inspected in April 2007 to identify areas where deer commonly cross the fence. Flags were hung in these locations to help make the fence more visible, and help reduce the number of deer that were getting hung up in the fence. A consultation with CDPHE was held on April 4 regarding this issue, and permanent fence flags (free-hanging plastic devices) were placed on the fence in the observed high-traffic areas in

May 2007. CDPHE approved RFLMA Contact Record 2007-01 regarding response to this adverse biological condition.

2.8.3.2 Perimeter Fence

The fence surrounding the outer perimeter of the POU was repaired as needed. Locations requiring repair included a portion along Indiana Street on the east, and a portion near the saw-mill on the northwest.

2.8.4 Site Security

Site surveillance is performed during times when Site personnel are not normally in the field (i.e., evenings and weekends).

2.8.4.1 Security Issues

During first quarter CY 2007 the subcontract surveillance personnel made numerous contacts with drivers of vehicles stopped near the Site, and were visible by passing motorists while stationed at their observation stations. Due to poor Site road conditions, in February the surveillance was limited to outer perimeter roads (public highways and streets) for safety reasons and to help protect the integrity of Site roads during periods of increased snowmelt. Normal surveillance routes resumed in late March 2007 after the completion of temporary road repairs.

Security-related notifications included one related to a television news helicopter that was flying around the Site, and another in which an individual was walking from the west access gate toward the west shed. All notifications were resolved without incident. A temporary sign was installed on the west gate indicating that the land is not open to the public.

End of current text